REMARKS/ARGUMENTS

The present Amendment is in response to the Office Action having a mailing date of June 9, 2004. Claims 1-14 are pending in the present Application.

In the above-identified Office Action, the Examiner objected to the information disclosure statement. In particular, the Examiner objected to the citation of U.S. patent applications serial numbers 09/036,354 and 09/522,965. Applicant has provided herewith an information disclosure statement listing U.S. patents 6,370,119 and 6,643,699, which are patents issued on the above-identified patent applications. Consequently, Applicant respectfully submits that the information cited is complete.

In the above-identified Office Action, the Examiner objected to the drawings. In particular, the Examiner objected to Figure 2, item 58 as missing textual information. Applicant has provided herewith a replacement copy of Figure 2 including the missing text. Consequently, Applicant respectfully submits that the Examiner's objection to the drawings has been addressed.

In the above-identified Office Action, the Examiner rejected claims 1-6 and 8-13 under 35 U.S.C. § 103 as being unpatentable over U.S. Patent No. 6,697,333 (Bawa) in view of U.S. Patent No. 6,697,333 (Bertin). The Examiner also rejected claims 7 and 14 under 35 U.S.C. § 103 as being unpatentable over Bawa and Bertin in further view of U.S. Patent No. 5,164,938 (Jurkevich).

Applicant respectfully disagrees with the Examiner's rejection of claims 1-6 and 8-13. Independent claim 1 recites:

> 1. A method for providing a path for a new flow between a source node and a destination node in a network having a plurality of nodes and a plurality of links between the plurality of nodes, the plurality of nodes including the source node and the destination node, each of the plurality of links capable of including a plurality of existing flows and having a capacity, each of the plurality of existing flows including a minimum guaranteed bandwidth, the method comprising the steps of:

(a) for a node of the plurality of nodes, determining a benefit for each link of a portion of the plurality of links, the portion of the plurality of links being coupled with the node, the benefit being determined based on the capacity of the link and the minimum guaranteed bandwidth for a portion of the plurality of existing flows that is through the link, the node being a part of the path; and

(b) selecting a link of the portion of the plurality of links to be part of the path, the link having a maximum benefit for the first portion of the plurality of links, the link coupling the node with a second node of the plurality of nodes.

Similarly, independent claim 8 recites

8. A computer-readable medium including a program for providing a path for a new flow between a source node and a destination node in a network having a plurality of nodes and a plurality of links between the plurality of nodes, the plurality of nodes including the source node and the destination node, each of the plurality of links capable of including a plurality of existing flows and having a capacity, each of the plurality of existing flows including a minimum guaranteed bandwidth, the program including instructions for:

(a) for a node of the plurality of nodes, determining a benefit for each link of a portion of the plurality of links, the portion of the plurality of links being coupled with the node, the benefit being determined based on the capacity of the link and the minimum guaranteed bandwidth for a portion of the plurality of existing flows that is through the link, the node being a part of the path; and

(b) selecting a link of the portion of the plurality of links to be part of the path, the link having a maximum benefit for the first portion of the plurality of links, the link coupling the node with a second node of the plurality of nodes.

Independent claim 9 recites:

9. A system for providing a path for a new flow between a source node and a destination node in a network having a plurality of nodes and a plurality of links between the plurality of nodes, the plurality of nodes including the source node and the destination node, each of the plurality of links capable of including a plurality of existing flows and having a capacity, each of the plurality of existing flows including a minimum guaranteed bandwidth, the system comprising:

first logic for determining a benefit for each link of a first portion of the plurality of links coupled to a node in the path, the benefit being determined based on the capacity of the link and the minimum guaranteed bandwidth for a portion of the plurality of existing flows that is through the link;

second logic for selecting a link of the first portion of the plurality of links to be part of the path, the link having a maximum benefit for the first portion of the plurality of links; and

a memory coupled with the first logic and the second logic, the memory for storing an identity of the link.

Thus, independent claims 1, 8, and 9 recite a method, computer-readable medium and system, respectively, for selecting a path between a source and a destination. In particular, selection of the path includes determining a benefit for each of some number of links connected to a node and selecting a link having the maximum benefit as the next link in the path. The benefit is "determined based on the capacity of the link and the minimum guaranteed bandwidth" for flows in the link. Thus, the method, computer-readable medium, and system recited in claims 1, 8, and 9 can account for differentiated services because of the use of the benefit. Specification, page 12, lines 15-19. Further, the path determined is thus optimized for minimum guaranteed bandwidths instead of being based solely on current bandwidths. Specification, page 12, lines 21-23. Stated differently, the use of minimum guaranteed bandwidths means that at least a portion of the route selection is not based upon the current status of the link (i.e. the flow rate through the link), but instead upon a minimum level of service that is already set.

Applicant agrees that Bawa describes a method for selecting a path including selecting links between nodes. Bawa, col. 2, lines 60-66. However, as the Examiner has acknowledged that Bawa does not describe a benefit that is determined based upon the capacity of the link and the minimum guaranteed bandwidth for a portion of the plurality of existing flows through the link. Consequently, Bawa alone does not teach or suggest the method, computer-readable medium, and system recited in independent claims 1, 8, and 9.

Bertin fails to remedy the defects of Bawa. Bertin describes a mechanism for selecting routes in a network. However, Applicant respectfully disagrees that Bertin teaches or suggests selecting a route based on a benefit that is determined based upon the capacity of the link and the minimum guaranteed bandwidth for a portion of the plurality of existing flows through the link. Instead, Bertin describes selecting a route based upon a capacity that is less than the theoretical

capacity of a link by a reserved bandwidth. Stated differently, Bertin teaches reserving a portion of the bandwidth of the link for existing traffic and using a fraction of the link capacity that is effectively available for carrying additional traffic. Bertin, col. 10, lines 9-15. In determining the amount of bandwidth to reserve, Bertin mentions two concerns: setting aside bandwidth for network control functions and to account for short term bandwidth violations of the different sources of traffic through the link. Bertin, col. 10, lines 15-27. Bertin describes determining an "equivalent fraction" to determine the amount of bandwidth reserved. Bertin, col. 10, lines 30-40. This equivalent capacity is "a function of the source characteristics and of the network status." Bertin, col. 10, lines 35-41. Thus, as Bertin states that the "bandwidth reservation falls somewhere between the average bandwidth required by the user and the maximum capacity of the connection." Bertin, col. 10, lines 35-41.

Applicant respectfully submits that there is no indication in Bertin of the use of a minimum guaranteed capacity for any part of route selection. Applicant respectfully submits that in the system of Bertin, there must be some minimum guaranteed bandwidth for the flows, even if this minimum guaranteed bandwidth is zero. Instead of basing route selection at least in part upon this (potentially zero) minimum, Bertin uses the reserved bandwidth that is apparently not the minimum bandwidth for the flows. Bertin specifically states that the reserved bandwidth, considered unavailable for use in carrying additional traffic, falls between an *average* bandwidth required by the user and the capacity of the link. If Bertin used any sort of minimum, the reserved bandwidth of Bertin would reside between the minimum bandwidth that might be used (e.g. zero) and the capacity of the link. Thus, the reserved bandwidth of Bertin is not analogous to the recited minimum guaranteed bandwidth. Furthermore, Bertin describes using concerns such as network control functions and short term violations in determining the reserved bandwidth. Applicant

respectfully submits that the minimum guaranteed bandwidth is not substantially related to either of these concerns. There is no indication in Bertin that a minimum guaranteed bandwidth or level of service can or should be used in determining the reserved bandwidth and the route selected. Consequently, Bertin fails to teach or suggest the use of a minimum guaranteed bandwidth in determining the benefit used in route selection.

Because both Bawa and Bertin fail to teach or suggest the use of a benefit that is determined based upon the capacity of the link and the minimum guaranteed bandwidth for a portion of the plurality of existing flows through the link, any combination of Bawa and Bertin would also fail to teach or suggest this feature. Consequently, Bawa and Bertin, separately or in combination, fail to teach or suggest the method, computer-readable medium, and system recited in claims 1, 8, and 9, respectively. Accordingly, Applicant respectfully submits that claims 1, 8, and 13 are allowable over the cited references.

Claims 2-6 and 10-13 depend upon independent claims 1 and 9, respectively. Consequently, the arguments herein apply with full force to claims 2-6 and 10-13. Accordingly, Applicant respectfully submits that claims 2-6 and 10-13 are allowable over the cited references.

The Examiner rejected claims 7 and 14 as being unpatentable over Bawa and Bertin in further view of Jurkevich.

Applicant respectfully disagrees with the Examiner's rejection. Claims 7 and 14 depend upon independent claims 1 and 9, respectively. Consequently, the arguments herein apply with full force to claims 7 and 14. In particular, Bawa and Bertin fail to teach or suggest determining a route based upon a benefit that is determined based upon the capacity of the link and the minimum guaranteed bandwidth for a portion of the plurality of existing flows through the link.

Jurkevich fails to remedy the defects of Bawa and Bertin. Applicant can find no mention in the cited portions of Jurkevich any minimum guaranteed bandwidth. Similarly, Applicant has found no mention in the cited portions of Jurkevich of selecting a route based upon a benefit that is determined based upon the capacity of the link and the minimum guaranteed bandwidth for a portion of the plurality of existing flows through the link. Consequently, Jurkevich fails to separately teach or suggest the use of a benefit that is determined based upon the capacity of the link and the minimum guaranteed bandwidth for a portion of the plurality of existing flows through the link.

Because Bawa, Bertin, and Jurkevich all fail to teach or suggest the use of a benefit that is determined based upon the capacity of the link and the minimum guaranteed bandwidth for a portion of the plurality of existing flows through the link in determining the route, any combination of Bawa, Bertin, and Jurkevich would also fail to teach or suggest this feature. Bawa, Bertin, and Jurkevich, separately or in combination, thus fail to teach or suggest the method and system recited in claims 7 and 14. Accordingly, Applicant respectfully submits that claims 7 and 14 are allowable over the cited references.

Applicant's attorney believes that this application is in condition for allowance. Should any unresolved issues remain, Examiner is invited to call Applicant's attorney at the telephone number indicated below.

Respectfully submitted,

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Date

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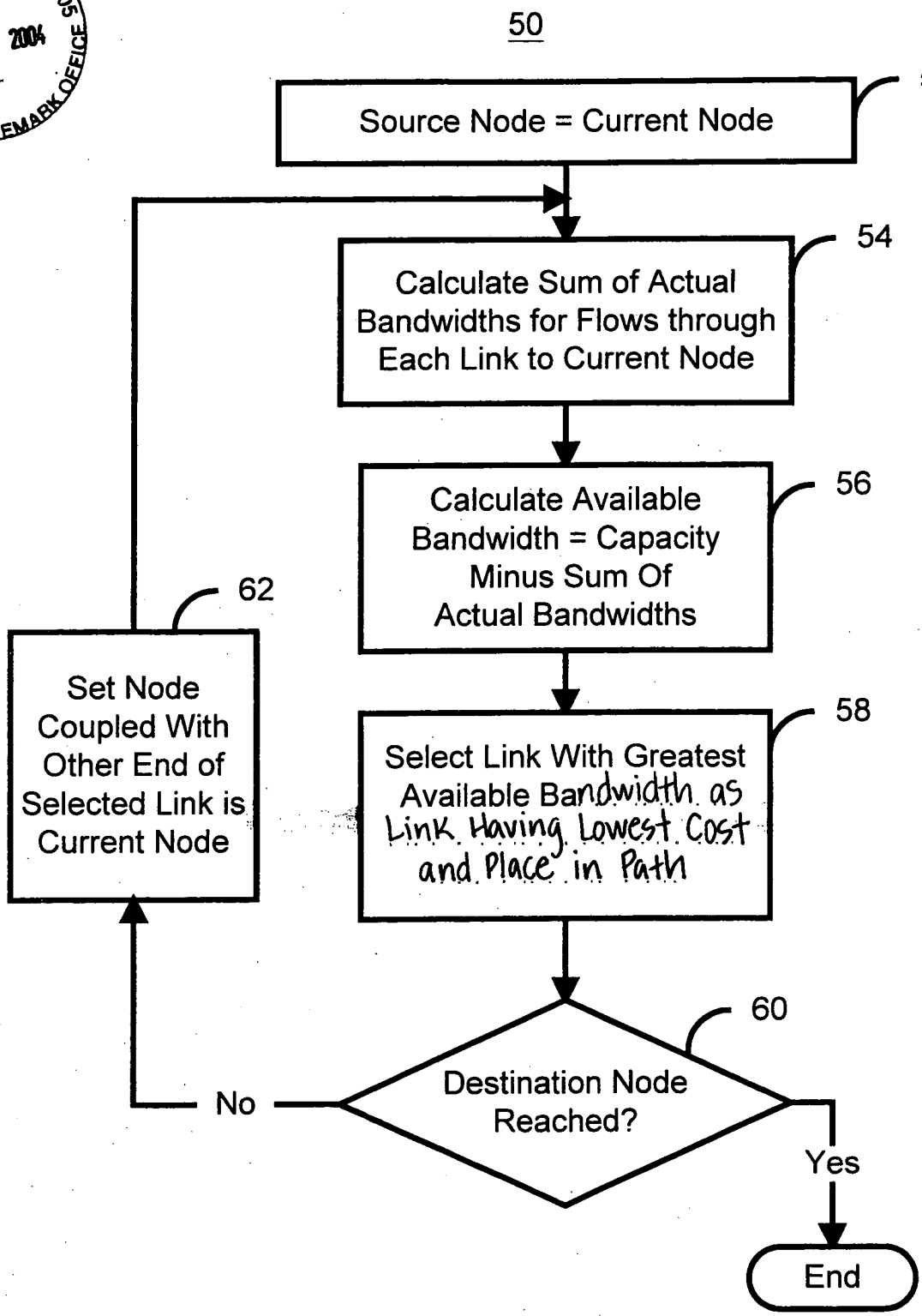

Prior Art

Figure 2